[0221] Basic IM Mechanism (See **FIG. 11**)

[0222] This part shows the basic mechanism used to implement the Instant Messaging Service over IP networks. In this case there are no changes between different networks. The unique inconvenience that the service has to deal with is the translation between different service providers and implementation of the similar service.

[0223] The user utilizes the SUBSCRIBE method with the CSCF to receive notifications about certain kinds of events. The type of event is indicated in the Event "header and in this case it would be "Event:Message".

[0224] Every time that the CSCF to which the user sub-scribed receives a message it will be notified to the user by the method NOTIFY. In the Event header is indicated the type of event and in the "Content-Type" is indicated the type of message (voice-message, SMS-text, SMS-picture, etc.)

[0225] In the case that the message is coming from another system or provider the message will be received at the CSCF that will store it in the Instant Messaging Server (IMS/ MMSC). If the message is originated in another network it is necessary an intermediate step for adapting the message format. From the user point of view such is hidden and it only will SUBSCRIBE to some specific "Event" and will receive the "NOTIFY" when it occurs.

[0226] Finally the user receives a notification about a new message. In the From header of the SIP is indicated the origin of that message. In the Contact is indicated the point where that message can be picked up (it can be either the Messaging Server address or the URL where the information is stored). In the Content-type would be indicated the nature of the message, if it is voice-message, picture, video-clip, etc.

[0227] Intemetworking IM

[0228] This part shows roughly the situation where the message or information is coming from another type of network. In such a case, as mentioned above, it is necessary to perform a format or even signalling translation. At this point the Signalling gateway for PTSN or the Roaming-Signalling gateway, in case of GSM, or mobile networks becomes important.

[0229] The first example is shown in **FIG. 12** and illus-trates a call coming from the PSTN network.

[0230] The first step is the user subscription in order to be made aware of any happening but without being disturbed.

[0231] The phone call is going through the Gateway (SIP/GW). The GW convert the normal voice call in an SIP INVITE message and it goes through the network till it reaches the CSCF where the end user was registered.

[0232] The CSCF receives the normal SIP call and based on the user's requirements it doesn't continue the normal call continuation. Instead, it converts the incoming informa-tion into a voice-message.

[0233] The CSCF stores the message at the Messaging Server.

[0234] Finally the CSCF will send a NOTIFY message to the user with the characteristics of the event that it received and was addressed to him. The message will indicate the "Content-Type voice-message" and where it can be picked up in the "Contact sip.messagecentre.nokia.com."

[0235] **FIG. 13** is similar with the difference that the origin is a well-known Short Message Service (SMS) from GSM networks. In this case it will need a Roaming Signal-ling GW (see also **FIG. 9**) for converting the message into an SIP transaction. The R-SGW will find out where the user is located and will send the normal SIP INVITE with the message information toward that user. From there the pro-cedure is similar to the previous case.

[0236] User is subscribed.

[0237] The message is originated at the GSM network The message reaches the SMS center and from there to the Roaming Signalling GW where it is converted to an SIP transaction. At this point there are two possibilities. The message is inserted in the body of an SIP INVITE and its nature is indicated in the Content-type. Otherwise, the SMS is directly matched with the already defined SIP MESSAGE method.

[0238] From there, the SIP message is addressed to the CSCF where the user is registered.

[0239] Now the procedure is similar to the previous cases. The message is stored at the messaging centre and it is notified to the user as shown in **FIG. 13**.

[0240] The last IM example is shown in **FIG. 14** where an All-IP network transaction is shown. I.e., there is no need for conversions. The Signalling is SIP based throughout and the call goes through the SIP enhanced networks without changes.

[0241] Presence and Messaging

[0242] In this part a couple of examples are shown where both presence and messaging services as implemented for providing a complete service. The Presence Server checks the user requirements and acts based on that. It saves network resources according to the user profile specification.

EXAMPLE 1

[0243] (See **FIG. 15**)

[0244] Initially all the users (Boss, Lawyer, Wife) are subscribed providing their information, including service requirements. Some of the are free and others are busy but want to be aware of any happening. Thus at this point the users' information is stored at the Presence Server.

[0245] One of the users is busy (Lawyer) and does not want to be disturbed. Instead, she will subscribe to the Messaging server to receive notifications anyway.

[0246] The Subscription is Achieved at the Messaging Server.

[0247] The third user (Wife) wants to establish a transac-tion with two people (Boss, Lawyer) at the same time. She initiates a SIP session with both of them.

[0248] The SIP INVITE request arrives to the CSCF but instead of being forwarded the CSCF first starts to search for information about the end users. The CSCF requests the presence Server for any clue about the invited users.

[0249] The CSCF based on the response from the Presence Server finds out that one of the users is available (Boss) and the other is busy (Lawyer).